GRIFFIN INTERNATIONAL INC

Aug 17 9 57 AM '99

August 12, 1999

Mr. Michael Young
VTDEC
Sites Management Section
103 South Main Street
Waterbury, VT 05671-0404

**RE: Bennington College Maintenance Facility**
**Initial Site Investigation Report**
**VTDEC Site No. 96-2067**

Dear Mr. Young:

Please find a copy of the above-referenced report for your review. Mr. Bill Tronsen of Bennington College requested that a copy be forwarded to you for review. Please do not hesitate to call, if you have any questions or comments.

Sincerely,

Rob Higgins
Staff Engineer

Enclosure

Cc: Griffin Project #59841270
Bill Tronsen, Bennington College

P.O. Box 943 • Williston, VT 05495 • Phone/Fax 802-865-4288
59 Clinton Street • Plattsburgh, NY 12901 • 518-562-4666 • Fax 518-561-6832

# INITIAL SITE INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION AT BENNINGTON COLLEGE MAINTENANCE FACILITY

**AUGUST 12, 1999**

**Site Location:**

**Bennington College Maintenance Facility**
**Route 67A**
**Bennington, VT**

**VTDEC SITE #96-2067**
**GI Project #59841270**

**Prepared For:**

**Mr. William Tronsen**
**Bennington College**
**Route 67A**
**Bennington, VT 05201**

**Prepared By:**


**P.O. Box 943 / 20 Commerce Street Williston, VT 05495 (802) 865-4288**

## Table of Contents

# I. INTRODUCTION

This report summarizes the initial investigation of subsurface petroleum contamination at the Bennington College Maintenance facility located off of Route 67A in Bennington, VT (see Site Location Map in Appendix A). This investigation was conducted by Griffin International, Inc. (Griffin) for Bennington College. Investigative efforts at the site were conducted due to the detection of subsurface petroleum contamination during the removal of one 550-gallon gasoline underground storage tank (UST) on December 1, 1998. This investigation was conducted to define the extent and degree of residual petroleum contamination remaining in the subsurface at the site. The investigation consisted of the following tasks:

1. The installation of four groundwater monitoring wells.
2. Groundwater sample collection from the monitoring wells to characterize the degree of groundwater contamination in the former source area.
3. Determination of groundwater flow direction and gradient.
4. A survey of potential sensitive receptors in the vicinity of the Bennington College Maintenance Facility.
5. Preparation of a summary report (this document).

The Vermont Department of Environmental Conservation (VTDEC) requested that this work be completed in a letter to Mr. Bob Ayers formerly of Bennington College from Mr. Chuck Schwer of the VTDEC, dated February 21, 1999. All work at the site was conducted in accordance with the March 1, 1999 Work Plan and Cost Estimate prepared by Griffin. Approval to proceed with this plan was given in a letter dated March 15, 1999 from Mr. Michael Young of the VTDEC to Mr. Ayers.

# II. BACKGROUND

## A. Background Information

On December 1, 1998, Griffin inspected the removal and permanent closure of one 550-gallon single-walled steel gasoline UST, which had been used to store gasoline for use in the college vehicles. The UST was observed to be in good condition with minor rust and no pitting. The UST was inferred to be approximately 30 years old.

Volatile organic compound (VOC) concentrations, measured with an HNu™ photoionization detector (PID) equipped with a 10.2 eV bulb, ranged from 0 parts per million (ppm) to 80 ppm [5 feet below surface grade (bsg)]. Soils in the excavation consisted of coarse to fine gravel from grade to a depth of approximately 3.5 feet bsg. Coarse sand was observed below depths of 3.5 feet bsg. Groundwater was encountered at a depth of approximately 4 feet bsg. A petroleum sheen was observed on the groundwater in the UST excavation pit. Excavated soils with measurable PID readings were backfilled into the UST pit.

### B. Site Description

The subject property is located within Bennington College off of Route 67A in Bennington, Vermont. The site is located within a residentially zoned portion of town. The Bennington College Maintenance Facility consists of three buildings: the maintenance facility office building located on the northern portion of the site, the maintenance garage located on the eastern portion of the site, and the salt/sand shed located on the southern portion of the site. These buildings are situated on concrete slab foundations. The remainder of the site is occupied by paved and unpaved driveway/parking areas, and wooded and grassy areas.

A grassy embankment, which slopes to the south, is located on the northeastern portion of the site. However, general topography across the site slopes to the west-southwest. Based on field observations and a review of the United States Geological Survey (USGS) Bennington, VT topographic map (1954) and field observations, groundwater beneath the site is inferred to flow to the west, towards Paran Creek, located approximately 1,000 feet west of the subject site. The subject site is located at approximately 650 feet above sea level.

### C. Site Geology

According to the Surficial Geologic Map of Vermont (Doll, 1970) surficial materials at the subject site are mapped as glacial till and outwash deposits. According to the Bedrock Geological Map of Vermont (Doll, 1961), the subject property is underlain by the Upper Cambrian-aged Clarendon Springs, Ticonderoga, and Rock River Dolomites and the Lower Ordovician-aged Shelburne, Whitehall, and Strites Pond Formation. These formations consist of fairly uniform, massive smooth weathered gray dolomite, and white marble or gray limestone with dolomite.

## III. INVESTIGATIVE PROCEDURES

### A. Monitoring Well Installation

On May 3, 1999, four monitoring wells (MW-1 through MW-4) were installed by T&K Drilling of Troy, New Hampshire using a hollow stem auger rig. Drilling and well construction were directly supervised by a Griffin engineer. Soil samples were collected at intervals of every five feet. Soil samples were screened for VOCs using an Hnu™ Model PI-101 PID equipped with a 10.2 eV bulb. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening

Protocol, which conforms to state and industry standards. Contaminant concentrations and soil characteristics were recorded in a detailed boring log by the supervising Griffin engineer (see Well Logs, Appendix B). No soil samples were submitted for laboratory analysis.

The monitoring wells were installed in the area around the former UST pit to assist in defining the degree and extent of residual subsurface petroleum contamination. Monitoring well MW-2 was installed in the location of the former 550-gallon gasoline UST. Subsurface conditions encountered from zero to approximately 2 feet bsg in the borings for the monitoring wells consisted of clean sands and sandy soils, underlain by silts, clays, and sands to an approximate depth of 7 feet bsg. Soils below this interval to a depth of approximately 12 feet bsg consisted of sandy soils and silty/clayey sands. Groundwater was encountered between 5 feet to 7 feet bsg on the day of drilling. Bedrock was not encountered during the drilling activities.

No PID readings above detection limits were noted in soils from monitoring wells MW-1, MW-3, and MW-4. A PID reading of 32 ppm was detected in the 5'-7' interval in the boring for monitoring well MW-2.

Each monitoring well was constructed with a seven foot to ten-foot length of 0.010-inch, factory slotted, 2-inch diameter, PVC screen installed with its midpoint at the approximate groundwater elevation. The wells were completed to one-half foot below the ground surface with Schedule 40, 2-inch diameter, PVC, flush-threaded riser. A silica sand pack was placed in the annulus of the well between the borehole wall and the screen to a level approximately one foot above the top of the screened interval. A bentonite seal was placed above the sand pack to isolate the screened interval and prevent migration of surface runoff water into the well. The wells were completed to the ground surface with a flush-mounted road box set in concrete. Well construction details can be found in Appendix B.

## B. Determination of Groundwater Elevations, Flow Direction, and Gradient

The monitoring well locations and elevations were surveyed on May 18, 1999 for inclusion on the Site Map (Appendix A). Measured depths to water ranged from approximately 3.81 feet below top of casing (btoc) (MW-4) to 4.58 feet (MW-1). Liquid level measurement data can be found in Appendix C. No free-phase petroleum product was observed on groundwater during the well gauging and sampling event.

Based on groundwater level measurements, groundwater at the site was determined to flow in a westerly direction. This groundwater flow direction is consistent with that inferred by topographic map review and field observations. A groundwater contour map can be found in Appendix A.

## C. Groundwater Sample Collection and Analysis

On May 18, 1999 groundwater samples were collected from the four monitoring wells, stored on ice, and submitted to Endyne, Inc. of Williston, Vermont, a state-certified laboratory, under proper chain-of-custody procedures. The samples were collected according to Griffin's groundwater sampling protocol, which complies with industry and state standards. The samples were analyzed for VOCs by EPA Method 8021B. In accordance with VTDEC protocols and for quality assurance/quality control (QA/QC) purposes, a duplicate sample (MW-2) and a trip blank were also collected and analyzed for VOCs by EPA Method 8021B.

No VOCs were reported as detected above laboratory detection limits in groundwater from monitoring wells MW-1, MW-3, and MW-4. Toluene, 1,2,4-Trimethylbenzene (TMB), and methyl tertiary butyl ether (MTBE) were detected in groundwater from monitoring well MW-2. The detected levels of VOCs do not exceed the applicable Vermont Groundwater Enforcement Standards (VGESs). Laboratory results can be found in Appendix D.

Results from the analyses of the trip blank sample indicate that adequate QA/QC measures were maintained during sample collection and analysis.

## D. Sensitive Receptor Risk Assessment

A visual survey of the area surrounding the Bennington College Maintenance Facility Site was conducted in May 1999 in conjunction with the monitoring well installation activities. Based on these observations, an estimation of the potential risk to identified receptors was made based on proximity to the source areas, groundwater flow direction, and contaminant concentration levels in subsurface soils and groundwater.

*Water Supplies*

The subject site is serviced by municipal water supplied by the Town of Bennington. No on-site water supply wells were identified. No private water supply wells were identified within a ½ mile radius of the subject site.

*Buildings in the Vicinity*

An office building, a maintenance garage, and a salt/sand shed are located on the subject property. Each building is situated on a concrete slab foundation. Based on the negligible source area contamination at the site, there is likely to be little risk of petroleum vapor migration posed to area buildings by the former UST.

*Surface Water*

The closest surface water body is Paran Creek, which is located approximately 1,000 feet west of the subject site. A drainage ditch is located on the eastern (upgradient) portion of the site. No water was observed in the drainage ditch on the day of the receptor survey. No wetlands were observed on-site on the day of the inspection. Given the very low source area strength and lack of apparent off-site migration, Param Creek is not anticipated to be at risk from the subject site.

*Utility Corridors*

Groundwater at the site is located at approximately three to five feet below grade, approximately at the same elevation where underground utilities are typically found. There are no known underground utilities in the downgradient vicinity of the source area, and therefore the potential for dissolved contaminant migration through utility corridors is considered minimal. Given the absence of free phase product and the low levels of dissolved petroleum contamination in the former source area, the potential for significant vapor migration along utility corridors is considered negligible.

## IV. CONCLUSIONS

Based on the additional site investigation at the Bennington College site, the following conclusions are offered:

1. One 550-gallon gasoline UST was removed from the site in December 1998. PID readings in soil ranged from non-detect to 80 ppm. A sheen was observed on groundwater in the excavation on the day of the removal. Impacted soils were backfilled into the UST excavation pit. Four groundwater monitoring wells were installed at the subject site in order to further characterize the degree and extent of residual petroleum impacts at the site.

2. Groundwater was measured at approximately 3.81 feet btoc to 4.58 feet btoc in the on-site monitoring wells on May 18, 1999. Groundwater was determined to flow in a westerly direction across the site. No free phase product was observed on groundwater during this investigation.

3. No VOCs were reported as detected above laboratory detection limits in groundwater from monitoring wells MW-1, MW-3, and MW-4. Toluene, MTBE, and 1,2,4-TMB were detected in groundwater from monitoring well MW-2. None of the detected compounds in groundwater exceeded the VGES. No free-phase petroleum product was observed during the sampling event. Groundwater was measured to flow in a westerly direction across the site.

4. Based on field observations and analytical results, residual petroleum impacts are present to a limited extent in soil and groundwater beneath the site, chiefly in the vicinity of monitoring well MW-2, which is located in the former UST pit. Buildings adjacent to the former UST location do not contain basements. There are currently no other known receptors affected by subsurface petroleum contamination from the former 550-gallon gasoline UST at the Bennington College Maintenance Facility.

5. With the apparent source removed (i.e., the former gasoline UST), and barring the identification of an additional source, it is expected that, over time, the natural processes of dilution, dispersion, and biodegradation will reduce dissolved contaminant concentrations present in groundwater and adsorbed contamination in soils beneath at the Bennington College Maintenance Facility.

## V. RECOMMENDATIONS

Based on the results of this site investigation, Griffin recommends that the Bennington College Maintenance Facility in Bennington, Vermont be considered for closure and be removed from the VTDEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VTDEC Site Management Activity Completed (SMAC) Checklist (dated December 1, 1997):

1) The source(s), nature, and extent of the petroleum contamination at the site have been adequately defined.

   See Conclusions #1, #3, and #4.

2) Source(s) has been removed, remediated, or adequately contained.

   See Conclusions #1, and #4.

3) Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.

   See Conclusions #1 and #3.

4) Groundwater enforcement standards are met at the following compliance points:

   *Any point of present use of groundwater as a source of potable water:* Groundwater at the former UST location is reportedly not utilized for potable water. Also, see Conclusion #3.

*Any point at or within the boundary of any Class I groundwater area:* The Bennington College Maintenance Facility is not within a Class I groundwater area.

*Any point at the boundary of the property on which the contaminant source is located:* See Conclusion #3.

5) Soil guideline levels are met. If not, engineering or institutional controls are in place.

See Conclusion #1. Also, the area in the vicinity of the former UST location is not paved. However, impacted soils were detected only in the boring for monitoring well MW-2 at a depth of 5-7 feet bsg. This "buffer" of non-impacted soils would inhibit exposure via dermal contact to petroleum-impacted soils.

6) No unacceptable threat to human health or the environment exists on site.

See Conclusions #3 and #4.

7) Site meets RCRA requirements.

Available records indicate that the Bennington College Maintenance Facility is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264.

8) Site meets CERCLA requirements.

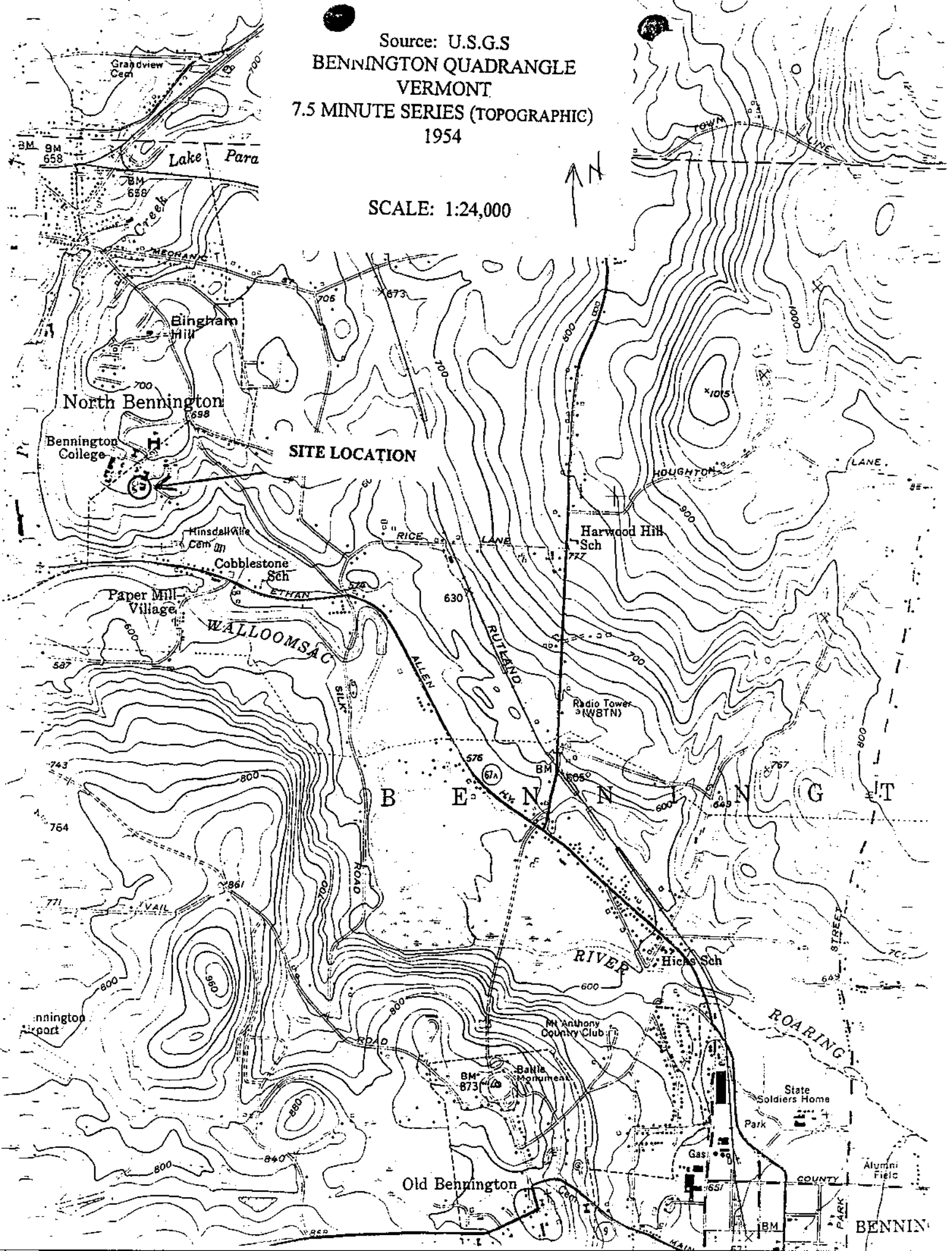
Available records indicate that the Bennington College Maintenance Facility is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

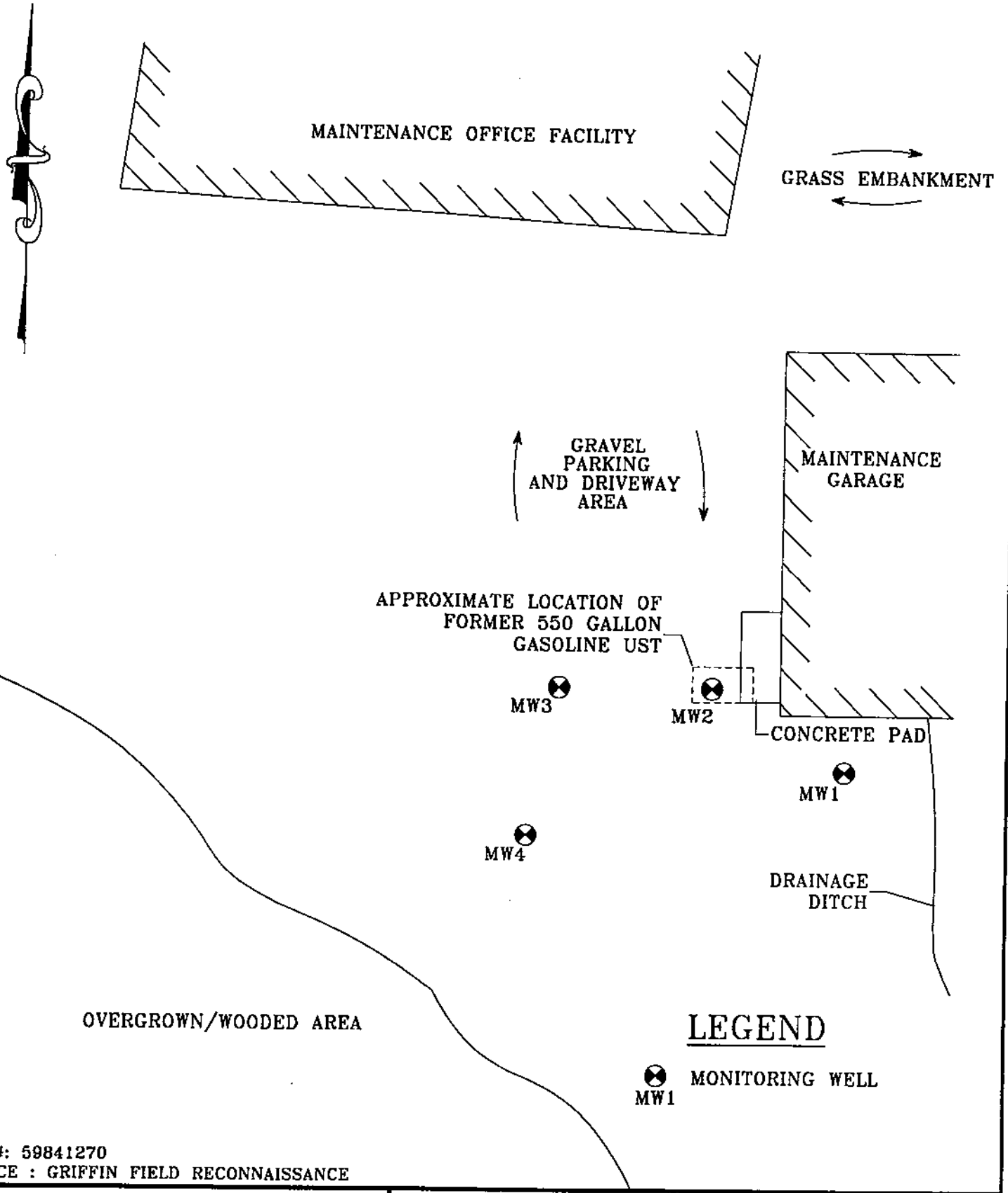
Additionally, Griffin recommends that the four site monitoring wells be properly abandoned according to VTDEC requirements for well closure.

# APPENDIX A

## MAPS

1) SITE LOCATION MAP
2) SITE MAP
3) GROUNDWATER CONTOUR MAP


Source: U.S.G.S
BENNINGTON QUADRANGLE
VERMONT
7.5 MINUTE SERIES (TOPOGRAPHIC)
1954
SCALE: 1:24,000
N
SITE LOCATION
North Bennington
Bennington College
Bingham Hill
Grandview Cem
Lake Para
Creek
MECHANIC
Hinsdallville Cem
Cobblestone Sch
Paper Mill Village
WALLOOMSAC
ETHAN
RICE
LANE
HOUGHTON
Harwood Hill Sch
RUTLAND
ALLEN
SILK
ROAD
Radio Tower (WBTN)
BENNINGTON
VAIL
RIVER
Hicks Sch
STREET
Mt Anthony Country Club
Battle Monument
BM 873
State Soldiers Home
Park
Gas
Alumni Field
COUNTY
PARK
Old Bennington
Cem
MAIN
BM
TOWN LINE




)B #: 59841270
SOURCE : GRIFFIN FIELD RECONNAISSANCE

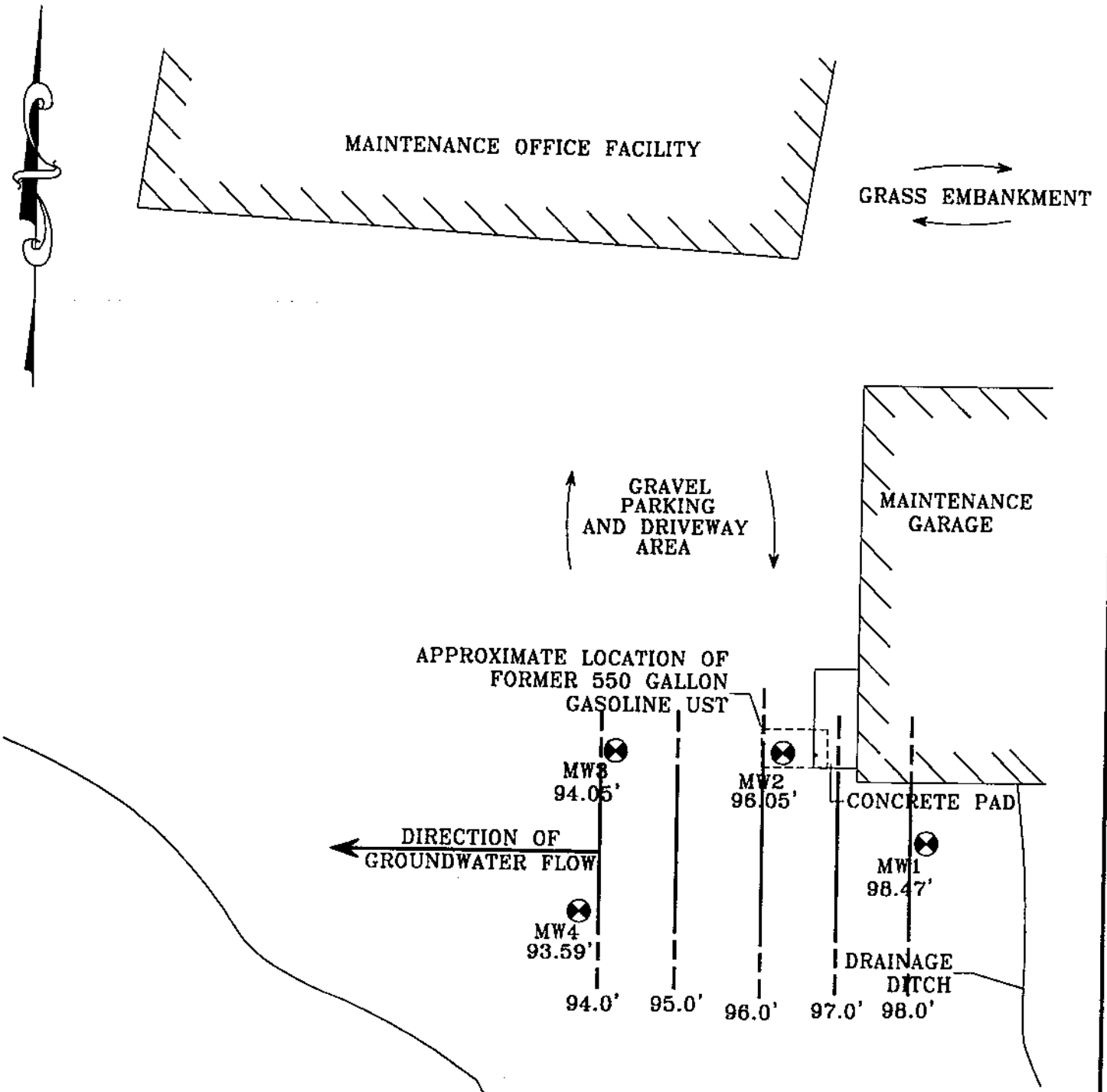
GRIFFIN INTERNATIONAL INC

BENNINGTON COLLEGE
MAINTENANCE FACILITY
ROUTE 67 A
BENNINGTON VT

# SITE MAP

VTDEC SITE NO. 96-2067

| DATE: 8/3/99 | DWG.#:1 | SCALE: 1"=50' | DRN.:JL | APP.:RH |
|---|---|---|---|---|




ROUNDWATER ELEVATIONS MEASURED ON 5/18/99 BY GRIFFIN
. B #: 59841270
SOURCE : GRIFFIN FIELD RECONNAISSANCE

GRIFFIN INTERNATIONAL INC

# BENNINGTON COLLEGE
## MAINTENANCE FACILITY
ROUTE 67 A
BENNINGTON VT

# GROUNDWATER CONTOUR MAP
VTDEC SITE NO. 96-2067

| DATE: 8/3/99 | DWG.#:1 | SCALE: 1"=50' | DRN.:JL | APP.:RH |
|---|---|---|---|---|

# APPENDIX B

# WELL LOGS

PROJECT BENNINGTON COLLEGE

LOCATION BENNINGTON, VERMONT

DATE DRILLED 5/3/99 TOTAL DEPTH OF HOLE 13.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

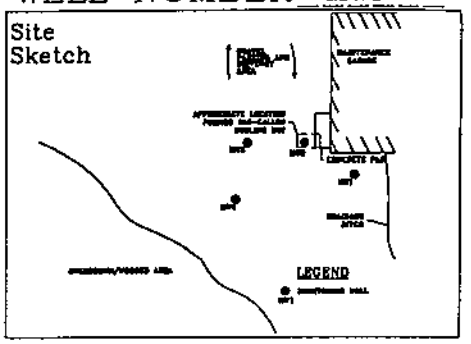
CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN TOMMILA LOG BY R. HIGGINS

WELL NUMBER MW1

Site Sketch




*GRIFFIN INTERNATIONAL, INC*

| DEPTH IN FEET | WELL CONSTRUCTION | NOTES | BLOWS PER 6" OF SPOON & PID READINGS | DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES) | DEPTH IN FEET |
|---|---|---|---|---|---|
| 0 | | ROAD BOX | | | 0 |
| 0 | | LOCKING WELL CAP | | | 0 |
| 0 | | CONCRETE | | CLEAN SAND (SW)- 90% fine sand, 10% fine gravel, dry, light brown. | 0 |
| 1 | | BENTONITE | 0'-2' 0 ppm | | 1 |
| 2 | | | | | 2 |
| 3 | | WELL RISER | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | | 5 |
| 6 | | SAND PACK | 5'-7' 16/18/18/12 0 ppm | 6.0' WATER TABLE ▼ | 6 |
| 7 | | | | SILTS AND CLAYS (OL)- 90% silt and clay, 10% fine sand, moist to wet, light brown. | 7 |
| 8 | | | | | 8 |
| 9 | | WELL SCREEN | | | 9 |
| 10 | | | | | 10 |
| 11 | | | 10'-12' 5/6/10/21 0 ppm | SAND AND SANDY SOILS (SW)- 30% silt, 70% fine sand, wet, light brown. | 11 |
| 12 | | BOTTOM CAP | | | 12 |
| 13 | | | | | 13 |
| 13 | | UNDISTURBED NATIVE SOIL | | BASE OF WELL AT 13' END OF EXPLORATION AT 13' | 13 |
| 14 | | | | | 14 |
| 15 | | | | | 15 |
| 16 | | | | | 16 |
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| 25 | | | | | 25 |

PROJECT BENNINGTON COLLEGE

LOCATION BENNINGTON, VERMONT

DATE DRILLED 5/3/99 TOTAL DEPTH OF HOLE 12.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 7.0' SLOT SIZE 0.010"

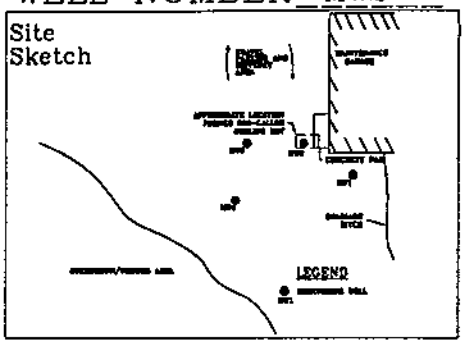
CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

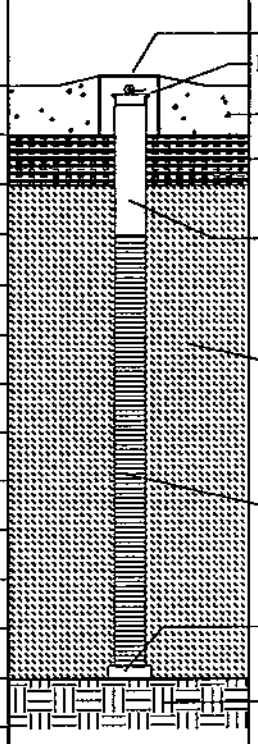
DRILLER ALAN TOMMILA LOG BY R. HIGGINS

WELL NUMBER MW2

Site Sketch




*GRIFFIN INTERNATIONAL, INC*

| DEPTH IN FEET | WELL CONSTRUCTION | NOTES | BLOWS PER 6" OF SPOON & PID READINGS | DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES) | DEPTH IN FEET |
|---|---|---|---|---|---|
| 0 |  | ROAD BOX<br>LOCKING WELL CAP<br>CONCRETE<br>BENTONITE<br>WELL RISER<br>SAND PACK<br>WELL SCREEN<br>BOTTOM CAP<br>UNDISTURBED NATIVE SOIL | 0'-2'<br>0 ppm<br>5'-7' 14/17/18/12<br>32 ppm<br>10'-12' 5/9/16/20<br>0 ppm | CLEAN SAND (SW)- 50% coarse sand, 50% coarse gravel, dry, light brown.<br>5.0' WATER TABLE<br>SAND AND SANDY SOILS (SC)- 50% clay, 50 % coarse sand, moist to wet, dark gray.<br>SANDS WITH FINES (SM)- 70% silt, 30% medium sand, wet, light brown.<br>BASE OF WELL AT 10'<br>END OF EXPLORATION AT 12' | 0 |
| 1 | | | | | 1 |
| 2 | | | | | 2 |
| 3 | | | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | | 5 |
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| 25 | | | | | 25 |

PROJECT BENNINGTON COLLEGE

LOCATION BENNINGTON, VERMONT

DATE DRILLED 5/3/99 TOTAL DEPTH OF HOLE 13.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

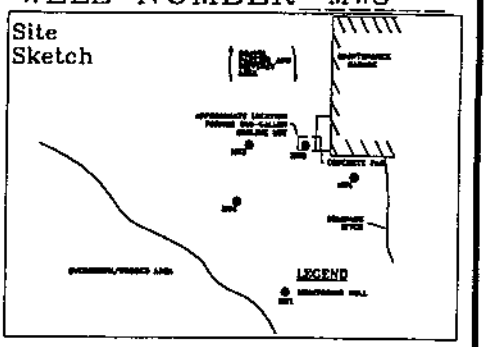
CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN TOMMILA LOG BY R. HIGGINS

WELL NUMBER MW3

Site Sketch




*GRIFFIN INTERNATIONAL, INC*

| DEPTH IN FEET | WELL CONSTRUCTION | NOTES | BLOWS PER 6" OF SPOON & PID READINGS | DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES) | DEPTH IN FEET |
|---|---|---|---|---|---|
| 0 | | ROAD BOX<br>LOCKING WELL CAP | | | 0 |
| 1 | | CONCRETE | | SAND AND SANDY SOILS (SW)- 10% silt, 90% medium sand, dry, light brown. | 1 |
| 2 | | BENTONITE | 0'-2'<br>0 ppm | | 2 |
| 3 | | WELL RISER | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | | 5 |
| 6 | | SAND PACK | 5'-7' 11/30/29/63<br>0 ppm | SILTS AND CLAYS (OL)- 90% silt, 10% fine sand, moist to wet, light brown. | 6 |
| 7 | | | | 7.0' WATER TABLE ▼ | 7 |
| 8 | | | | | 8 |
| 9 | | WELL SCREEN | | | 9 |
| 10 | | | | | 10 |
| 11 | | | 10'-12' 5/7/5/6<br>0 ppm | SANDS WITH FINES (SC)- 80% silt and clay, 20% coarse sand, wet, light brown. | 11 |
| 12 | | BOTTOM CAP | | | 12 |
| 13 | | UNDISTURBED NATIVE SOIL | | BASE OF WELL AT 13'<br>END OF EXPLORATION AT 13' | 13 |
| 14 | | | | | 14 |
| 15 | | | | | 15 |
| 16 | | | | | 16 |
| 17 | | | | | 17 |
| 18 | | | | | 18 |
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| 21 | | | | | 21 |
| 22 | | | | | 22 |
| 23 | | | | | 23 |
| 24 | | | | | 24 |
| 25 | | | | | 25 |

PROJECT BENNINGTON COLLEGE

LOCATION BENNINGTON, VERMONT

DATE DRILLED 5/3/99 TOTAL DEPTH OF HOLE 13.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

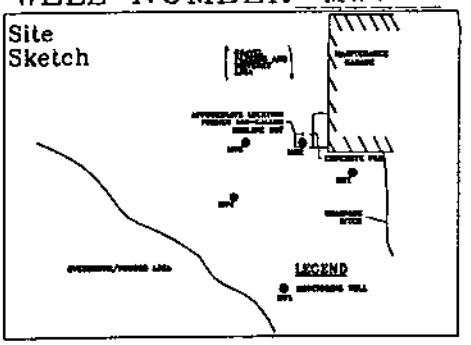
CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN TOMMILA LOG BY R. HIGGINS

WELL NUMBER MW4

Site Sketch




*GRIFFIN INTERNATIONAL, INC*

| DEPTH IN FEET | WELL CONSTRUCTION | NOTES | BLOWS PER 6" OF SPOON & PID READINGS | DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES) | DEPTH IN FEET |
|---|---|---|---|---|---|
| 0 | | ROAD BOX<br>LOCKING WELL CAP<br>CONCRETE | | | 0 |
| 1 | | | | CLEAN SAND (SW)- 90% fine sand, 10% fine gravel, dry, light brown. | 1 |
| 2 | | BENTONITE | 0'-2'<br>0 ppm | | 2 |
| 3 | | WELL RISER | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | SILTS AND CLAYS (OL)- 90% silt and clay, 10% fine sand, moist, light brown. | 5 |
| 6 | | SAND PACK | 5'-7' 2/16/10/19<br>0 ppm | | 6 |
| 7 | | | | 7.0' WATER TABLE ▼ | 7 |
| 8 | | | | | 8 |
| 9 | | WELL SCREEN | | | 9 |
| 10 | | | | SANDS WITH FINES (SC)- 80% silt and clay, 20% coarse sand, wet, light brown. | 10 |
| 11 | | | 10'-12'<br>0 ppm | | 11 |
| 12 | | BOTTOM CAP | | | 12 |
| 13 | | UNDISTURBED NATIVE SOIL | | BASE OF WELL AT 13'<br>END OF EXPLORATION AT 13' | 13 |
| 14 | | | | | 14 |
| 15 | | | | | 15 |
| 16 | | | | | 16 |
| 17 | | | | | 17 |
| 18 | | | | | 18 |
| 19 | | | | | 19 |
| 20 | | | | | 20 |
| 21 | | | | | 21 |
| 22 | | | | | 22 |
| 23 | | | | | 23 |
| 24 | | | | | 24 |
| 25 | | | | | 25 |

# APPENDIX C

# LIQUID LEVEL MEASUREMENT DATA

**Liquid Level Monitoring Data**
**Bennington College Maintenance Facility**
**Route 67A**
**Bennington, Vermont**
**VTDEC Site No. 96-2067**

Measurement Date: May 18, 1999

| Well I.D. | Well Depth (ft bTOC) | Top of Casing Elevation (ft) | Depth to Product (ft bTOC) | Depth to Water (ft bTOC) | Product Thickness (ft) | Specific Gravity of Product (*) | Hydro Equivalent (ft) | Corrected Depth to Water (ft bTOC) | Corrected Water Table Elevation (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | --- | 103.05 | --- | 4.58 | --- | --- | --- | --- | 98.47 |
| MW-2 | --- | 100.00 | --- | 3.95 | --- | --- | --- | --- | 96.05 |
| MW-3 | --- | 98.45 | --- | 4.40 | --- | --- | --- | --- | 94.05 |
| MW-4 | --- | 97.40 | --- | 3.81 | --- | --- | --- | --- | 93.59 |

bTOC = below Top of Casing (highest point on 2-inch PVC riser pipe)
Survey Date: 5/18/99, Griffin International
Benchmark: top of casing of MW-2

# APPENDIX D

# GROUNDWATER LABORATORY ANALYTICAL REPORT

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Bennington College
REPORT DATE: June 1, 1999
DATE SAMPLED: May 18, 1999

ORDER ID: 2393
REF.#: 138,661 - 138,666

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Bennington College
CLIENT PROJ. #: 59841270

DATE RECEIVED: May 19, 1999
REPORT DATE: June 1, 1999
ORDER ID: 2393

| Ref. #: | 138,661 | 138,662 | 138,663 | 138,664 | 138,665 |
|---|---|---|---|---|---|
| Site: | Trip Blank | MW #2 | Duplicate | MW #3 | MW #1 |
| Date Sampled: | 5/18/99 | 5/18/99 | 5/18/99 | 5/18/99 | 5/18/99 |
| Time Sampled: | 7:15 | 14:56 | 14:56 | 15:00 | 15:06 |
| Sampler: | DT/TC | DT/TC | DT/TC | DT/TC | DT/TC |
| Date Analyzed: | 5/25/99 | 5/26/99 | 5/26/99 | 5/26/99 | 5/25/99 |
| UIP Count: | 0 | 5 | 8 | 0 | 0 |
| Dil. Factor (%): | 100 | 100 | 100 | 100 | 100 |
| Surr % Rec. (%): | 112 | 101 | 102 | 101 | 99 |
| Parameter | Conc. (ug/L) | Conc. (ug/L) | Conc. (ug/L) | Conc. (ug/L) | Conc. (ug/L) |
| MTBE | <10 | 24.9 | 24.6 | <10 | <10 |
| Benzene | <1 | <1 | <1 | <1 | <1 |
| Toluene | <1 | 1.8 | 3.5 | <1 | <1 |
| Ethylbenzene | <1 | <1 | <1 | <1 | <1 |
| Xylenes | <1 | <1 | <1 | <1 | <1 |
| 1,3,5 Trimethyl Benzene | <1 | <1 | <1 | <1 | <1 |
| 1,2,4 Trimethyl Benzene | <1 | <1 | 4.5 | <1 | <1 |
| Naphthalene | <1 | <1 | <1 | <1 | <1 |

| Ref. #: | 138,666 |
|---|---|
| Site: | MW #4 |
| Date Sampled: | 5/18/99 |
| Time Sampled: | 15:10 |
| Sampler: | DT/TC |
| Date Analyzed: | 5/25/99 |
| UIP Count: | 0 |
| Dil. Factor (%): | 100 |
| Surr % Rec. (%): | 98 |
| Parameter | Conc. (ug/L) |
| MTBE | <10 |
| Benzene | <1 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| Xylenes | <1 |
| 1,3,5 Trimethyl Benzene | <1 |
| 1,2,4 Trimethyl Benzene | <1 |
| Naphthalene | <1 |

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

# CHAIN-OF-CUSTODY RECORD

| | | |
|---|---|---|
| Project Name: BENNINGTON COLLEGE<br>Site Location: BENNINGTON | Reporting Address: GRIFFIN | Billing Address: |
| Endyne Project Number: 2393 | Company:<br>Contact Name/Phone #: BOB HIGGINS | Sampler Name: DAVE TOURANGEAU<br>Phone #: TRIP CHG. |

| Lab # | Sample Location | Matrix | GRAB | COMP | Date/Time 5-18-99 | Sample Containers No. | Sample Containers Type/Size | Field Results/Remarks | Analysis Required | Sample Preservation | Rush |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 138661 | TRIP BLANK | H2O | X | | 07:15 | 2 | 40ml | | 8021B | HCL | |
| 138662 | MW #2 | | | | 14:50 | | | | | | |
| 138663 | DUPLICATE | | | | 14:50 | | | | | | |
| 138664 | MW #3 | | | | 15:00 | | | | | | |
| 138665 | MW #1 | | | | 15:06 | | | | | | |
| 138666 | MW #4 | | | | 15:10 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | |
|---|---|---|
| Relinquished by: Signature | Received by: Signature | Date/Time 5-19-99 10:15 |
| Relinquished by: Signature | Received by: Signature | Date/Time |

New York State Project: Yes ___ No X

**Requested Analyses**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | 6 | TKN | 11 | Total Solids | 16 | Metals (Specify) | 21 | EPA 624 | 26 | EPA 8270 B/N or Acid |
| 2 | Chloride | 7 | Total P | 12 | TSS | 17 | Coliform (Specify) | 22 | EPA 625 B/N or A | 27 | EPA 8010/8020 |
| 3 | Ammonia N | 8 | Total Diss. P | 13 | TDS | 18 | COD | 23 | EPA 418.1 | 28 | EPA 8080 Pest/PCB |
| 4 | Nitrite N | 9 | $BOD_5$ | 14 | Turbidity | 19 | BTEX | 24 | EPA 608 Pest/PCB | | |
| 5 | Nitrate N | 10 | Alkalinity | 15 | Conductivity | 20 | EPA 601/602 | 25 | EPA 8240 | | |
| 29 | TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides) | | | | | | | | | | |
| 30 | Other (Specify): | | | | | | | | | | |